

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	6189	438/25,51,106-108.ccls.	US-PGPUB; USPAT	OR	ON	2007/12/21 09:31
L2	3778	1 and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 09:31
L3	172	2 and MEMS	US-PGPUB; USPAT	OR	ON	2007/12/21 09:31
L4	5095	257/414,678,684,704.ccls.	US-PGPUB; USPAT	OR	ON	2007/12/21 09:31
L5	3036	4 and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 09:33
L6	204	5 and MEMS	US-PGPUB; USPAT	OR	ON	2007/12/21 09:31
L7	187	6 not 3	US-PGPUB; USPAT	OR	ON	2007/12/21 09:32
L8	2	((chip or die) and MEMS and cap and ceramic and carrier).clm.	US-PGPUB; USPAT	OR	ON	2007/12/21 09:34
L9	0	8 and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 09:34
L10	59	((chip or die) and MEMS and cap).clm.	US-PGPUB; USPAT	OR	ON	2007/12/21 09:34
L11	21	10 and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 11:26
L12	28	((chip or die) and MEMS and cap and plurality).clm.	US-PGPUB; USPAT	OR	ON	2007/12/21 09:34
L13	16	12 and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 10:01
L14	3	((plurality with caps) same carrier) and MEMS and via	US-PGPUB; USPAT	OR	ON	2007/12/21 10:02
L15	0	14 and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 10:02
L16	9337	plurality and carrier and MEMS and via	US-PGPUB; USPAT	OR	ON	2007/12/21 10:02
L17	4482	16 and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 10:02
L18	2559	17 and (die or chip)	US-PGPUB; USPAT	OR	ON	2007/12/21 10:02
L19	400	17 and (plurality with (die or chip))	US-PGPUB; USPAT	OR	ON	2007/12/21 10:03
L20	9	(zero with shrink with ceramic) and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 11:27
L21	320	(zero with shrink) and @ad<"20030630"	US-PGPUB; USPAT	OR	ON	2007/12/21 11:27

## EAST Search History

L22	311	21 not 20	US-PGPUB; USPAT	OR	ON	2007/12/21 11:27
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US-PAT-NO: 7170155

DOCUMENT-IDENTIFIER: US 7170155 B2

TITLE: MEMS RF switch module including a vertical via

----- KWIC -----

Application Filing Date - AD (1):

**20030625**

Claims Text - CLTX (1):

1. An apparatus, comprising: a micro-electro-mechanical system (**MEMS**) **die** including at least one **MEMS** device and one or more **MEMS** contacts electrically coupled to the at least one **MEMS** device; a **cap** coupled to the **MEMS die** to form an enclosure around the at least one **MEMS** device, the **cap** including one or more internal contacts, each internal contact being electrically coupled to a corresponding external contact by a via extending through the **cap**, wherein at least one of the internal contacts can be electrically coupled to at least one of the one or more **MEMS** contacts; and a trace ring disposed within the enclosure and coupled to the at least one **MEMS** device, wherein one of an input terminal or an output terminal for the at least one **MEMS** device is coupled to the trace ring.

Claims Text - CLTX (2):

2. The apparatus of claim 1 wherein the at least one **MEMS** device comprises a radio frequency (RF) switch array including at least one switch.

Claims Text - CLTX (3):

3. The apparatus of claim 1 wherein the one or more **MEMS** contacts include an input terminal, an output terminal, and an actuation terminal.

Claims Text - CLTX (5):

5. The apparatus of claim 1 wherein the trace ring surrounds at least a portion of the at least one **MEMS** device to allow a signal to transit the **MEMS** module using at least one of the vias without crossing the trace ring.

Claims Text - CLTX (6):

6. The apparatus of claim 1, further comprising a seal ring to couple the **cap to the MEMS die such that the cap and the die** sealingly enclose the at

least one MEMS device.

Claims Text - CLTX (9):

9. An apparatus comprising: a MEMS die including an array of MEMS radio frequency (RF) switches and one or more MEMS contacts electrically coupled to at least one of the switches in the array; a cap coupled to the MEMS die to form an enclosure around the array, the cap including one or more internal contacts, each internal contact being electrically coupled to a corresponding external contact by a via extending through the cap, wherein at least one of the internal contacts can be electrically coupled to at least one of the one or more MEMS contacts; and a trace ring disposed within the enclosure and coupled to the array, wherein one of the input terminal or the output terminal is coupled to the trace ring.

Claims Text - CLTX (10):

10. The apparatus of claim 9 wherein the cap is coupled to the MEMS die by a seal ring.

Claims Text - CLTX (11):

11. The apparatus of claim 9 wherein the cap comprises Silicon.

Claims Text - CLTX (12):

12. The apparatus of claim 9 wherein the cap comprises a ceramic material.

Claims Text - CLTX (13):

13. The apparatus of claim 9 wherein the one or more MEMS contacts comprise: an input terminal electrically coupled to at least one switch in the array; an output terminal coupled to at least one switch in the array; and an actuation terminal electrically coupled to at least one switch in the array.

Claims Text - CLTX (15):

15. The apparatus of claim 13 wherein the MEMS die comprises a second MEMS RF switch array electrically coupled to a second input terminal and to a second actuation terminal, the second RF switch array electrically coupled to the output terminal.